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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,361	04/12/2004	Ilya Karpov	ITL.0835D1US (P14730D)	3077
21906 7590 03/21/2007 TROP PRUNER & HU, PC 1616 S. VOSS ROAD, SUITE 750 HOUSTON, TX 77057-2631			EXAMINER PHAM, LONG	
			ART UNIT	PAPER NUMBER
			2814	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/21/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/822,361

Applicant(s)

KARPOV ET AL.

Examiner

Long Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10, 11 and 16-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10, 11 and 16-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                      | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 10, 16, 17, 18, 20, and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Nishida et al. (US patent 6,461,934).

With respect to claim 10, Nishida et al. teach an integrated circuit comprising (see figs. 1-5 and associated text):

a semiconductor structure 101 or substrate;

a first trench 103b formed of a first depth in said semiconductor structure;

a covering 106 on said first trench and over said semiconductor structure, said covering being thicker in said first trench than over said semiconductor structure (the corner portion of 106 in the trench); and

said covering having an opening through a thinner portion (as compared to the thicker portion (the corner portion of 106 in the corner) of said covering that is over said semiconductor structure (anywhere not in the substrate is considered as over or on), the thinner portion other than the thicker covering in said first trench, said opening to define a region for a second trench.

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Further with respect to claim 10, Nishida et al. further teach the covering having an opening through a thinner portion of the covering that is over the semiconductor structure (fig. 3, covering 106 has thinner portion in the middle of the trench 103b and opening is formed in the middle of trench (see fig. 4) and the thinner portion other than the thicker portion of the covering in the first trench).

Further with respect to claim 10, the replacement of "covering" with "temporary covering" does not change the scope of the claim structurally.

With respect to claim 16, Nishida et al. further teach the opening is a second trench. See figs. 1-5.

With respect to claim 17, Nishida et al. further teach said second trench 103c extends transversely to or crosses said first trench (at least in the cross sectional view). See figs. 1-5 and associated text.

With respect to claim 18, Nishida et al. further teach said second trench (103c) shallower than said first trench 103b. See figs. 1-5 and associated text.

With respect to claim 20, Nishida et al. teach the covering in the first trench has upstanding portion (the top portions of 106b) that extends (upperward) beyond a bottom surface of the trench trench 103c.

With respect to claim 26, Nishida et al. further teach said thinner portion of said covering (106 over 105) is over said semiconductor structure other than over said semiconductor structure in said trench (106 in middle and bottom of trench). See figs. 1-5 and associated text.

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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Claims 11 and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Nishida et al. (US patent 6,461,934).

With respect to claim 11, Nishida et al. fail to teach that the covering is made of spin-on-glass material.

However, the use of spin-on-glass as covering material is well-known in the art.

With respect to claim 19, Nishida et al. further teach that an opening is formed through the covering and is used as mask to define an opening for forming a second trench but fail to teach the opening is formed such that opening does not extend all the way through covering.

However, It would have been obvious to one of ordinary skill in the art of making semiconductor devices to form an opening in the covering such the a thin portion of the covering is remained over the substrate in the opening so as to provide buffering or protection for substrate during the formation or etching of the second trench.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 21, 22, 23, 24, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Wen et al. (US pat 5,460,987)

With respect to claim 21, Wen et al. teach an integrated circuit comprising (see figs. 1-8 and associated text):

A semiconductor structure 31;

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A first and second trench 41, 43 formed in said semiconductor structure, said first trench formed to a first depth, said second trench transverse (at least in the cross sectional plane) to said first trench and formed to a second depth less than said first depth; and

A covering 25 in said first trench and over the semiconductor structure (fig. 5), said covering having an opening therethrough (fig. 8), said opening in communication with said second trench.

With respect to claim 22, Wen et al. further teach the covering partially fills said first trench. See fig. 6.

With respect to claim 23, Wen et al. further teach the covering in said first trench includes an upstanding portion (see fig. 8, the sides of trench 43) at the intersection of said first and second trenches, the upstanding portion extending above a bottom surface of said second trench 43 to an upper surface of said substrate.

With respect to claim 24, it is submitted "covering" and "temporary covering" are structurally the same.

With respect to claim 25, Wen et al. further a portion of said covering that is over said semiconductor structure (see fig. 5, 25 on the left side) is thinner than a portion of said covering in said first trench (25 in the trench), said thinner portion of said covering covering other than in said first trench.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long Pham whose telephone number is 571-272-1714. The examiner can normally be reached on Mon-Frid, 10am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax

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phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Long Pham

Primary Examiner

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LP